Kentucky Geological Survey
UNIVERSITY OF KENTUCKY

Kentucky Geology

Earth Resources—Our Common Wealth

Summer 2002 **Volume 3, Number 2**

Kentucky Geological Survey
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Our mission is to increase knowledge and understanding of the mineral, energy, and water resources, geologic hazards, and geology of Kentucky for the benefit of the Commonwealth and Nation.

In this issue

First annual Donald C. Haney Distinguished Lecturer

Susan Landon honored

Susan M. Landon, an independent petroleum geologist and consultant affiliated with Thomasson Partner Associates in Denver, Colo., presented the first annual Donald C. Haney Distinguished Lecture on April 24. Her lecture, "Opportunities and Challenges for the U.S. Petroleum Industry: The Next 50 Years," provided an insightful overview of the history of demand and supply trends, changing patterns of resource use, environmental issues such as global warming and Federal clean air regulations, and geopolitical developments. This provided the context for her analysis of future issues that will confront the industry. She concluded that the nation does not face a shortage of oil and gas in the future. The nation's oil supplies are well insulated from potential oil embargoes because the United States has diversified its imports, and the countries that now export to the United States are much more dependent on revenue from the United States to support their economies. She was optimistic that there will be a smooth transition to alternative fuels, and predicted that vehicles will be powered by hydrogen gas or alternative fuel by mid-century. She expressed confidence about the ability of the U.S. petroleum industry to develop its resources in an environmentally appropriate manner. ❖

Left to right: Donald Haney, Susan Landon, Jim Cobb

Outstanding achievement award for "The Map Guy"

Terry Hounshell, Chief Cartographic Illustrator at KGS, received the "Outstanding Achievement Award" from KGS Director Jim Cobb on April 26 at the Survey's annual seminar in Lexington. The award was presented in recognition of Terry's leadership in the advancement of digital cartography for KGS. It was the first time such an award has been granted to a Survey employee.

Although Terry is one of the most valuable employees at KGS, he would be the last to admit it. The maps created at KGS are among its most important products. These maps must incorporate the geologic data of KGS researchers and display them in a clear, representative way. For 16½ years, it has been Terry's

(Continued on page 2)

Terry Hounshell

Modeling the subsurface

Ed Woolery received a grant in the form of a suite of software from Seismic Micro-Technology in Houston, Tex. The software, worth $216,500, will enable Woolery and his colleages in the engineering geophysics and seismology research program at the Kentucky Geological Survey and the UK Department of Geological Sciences to model subsurface geologic behavior from seismic images generated for petroleum exploration, groundwater investigations, and other research. The software will provide the University of Kentucky with a research capability unique among universities in the central United States. ❖

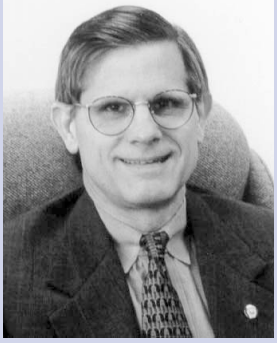
Director's Desk

A few years ago, a movie called "The Perfect Storm" dramatized the loss of a fishing boat in a storm in the North Atlantic. The title "Perfect Storm" came from scientists tracking three huge systems that merged into the worst of all possible scenarios; but it was meteorologically fascinating. What excited the scientists devastated the fishing fleet, and many lives were lost. Obviously, to some it was not the perfect storm.

We can say now that we experienced the **perfect earthquake** on June 18 at 1:37 P.M. Its magnitude was 5.0, and its epicenter was in the Evansville, Ind.–Henderson, Ky., area. It caught people's attention, but no one was hurt and no property was damaged. It raised the public's interest in earthquakes, and therefore brought media attention to seismology and geology.

The Kentucky Seismic and Strong-Motion Network, jointly operated by KGS and the UK Department of Geological Sciences, recorded the earthquake and fed the seismic recordings to the public in real time over the Survey's World Wide Web site (www.uky.edu/KGS/geologichazards/geologichazards.html). Reporters and camera crews swamped the Survey with requests for interviews. The seismology crew at KGS—John Kiefer, Zhenming Wang, and Ed Woolery—had their hands full responding to these requests.

Years of hard work have gone into making the Kentucky seismic network the third largest in the eastern United States. Ron Street, now UK professor emeritus, built the original network. John Kiefer, working with Street, was successful in obtaining funding from the State to purchase equipment to improve the network. Ed Woolery and Zhenming Wang are the current operators of the network. They use the data they obtain from the network for both scientific research and public service.



The June 18 earthquake was indeed the "Perfect Earthquake": it raised public and scientific interest and no one was hurt. It is a reminder, though, that stronger earthquakes are possible, so all of us should do the commonsense things to be as prepared as possible. The next one may not be so perfect! ❖

James C. Cobb

*(**Map Guy,** continued from page 1)*

responsibility to create maps at the Survey.

One of the biggest challenges for any cartographer is to be proficient, both technically and artistically. Technical skills are now required because of the new tools and options computers have introduced. Graphics software, such as FreeHand, provides strong tools to easily change the style, shape, color, and other attributes of lines, polygons, text, symbols, or other map entities. Geographic information system (GIS) software makes georeferencing, projection changes, data sharing, and other map-related chores possible. Artistically, a cartographer needs to have an eye for design, because the colors and layout of the map still have to be decided. Terry said that he tries to make his computer-generated maps look like the traditional paper maps, because they are pretty and eye-pleasing. "Actually," Terry claimed, "it's easier now to make traditional-looking maps than it used to be."

Terry did emphasize, however, that there is still a need for the traditional knowledge of cartography. He claimed his extensive background has helped him in the transition to computers because he knew what he wanted the end product to look like; so, rather than doing it manually as in the past, he has been able to achieve it using the computer.

Terry has been especially innovative in the adaptation and integration of diverse software packages. He has to integrate AutoCAD, FreeHand, and ArcView to produce the types of maps he desires. He mentioned that the most significant change for cartography, apart from the computers, is that the public has more, and easier, access to maps online.

Until recently, the technology was not available for KGS to print high-quality geologic maps in-house. When the printing technology became available, Terry did the necessary research and recommended that KGS buy an ink-jet plotter that would enable him to print the maps at KGS, rather than have to send them off to a commercial press. He was able to significantly reduce the production costs of printing maps. Recently, he displayed a map of the Harrodsburg 30 x 60 minute quadrangle generated by a commercial printing press and a map of the Lexington 30 x 60 minute quadrangle printed on an in-house ink-jet plotter: there was no significant difference in quality or appearance.

Terry is extremely intuitive in understanding how the technology associated with cartography is evolving. Once he recognizes a problem, he conducts research to inquire about available new technology; tests software, printers, plotters, and paper supplies; experiments with integrating different software; speaks with vendors; and persists until he has found a solution that meets his needs. As a result, the problems are always addressed, and the products he generates are first class. When asked what his favorite part of the job is, Terry laughingly replied "pay day," then, more seriously, stated, "Producing a big, beautiful map everyone is satisfied with."

Terry is a dedicated worker, doing what he loves—cartography. ❖

—By **Melissa Harper,**
Communications Intern

Enhanced Access to KGS Publications and Data on the Web

Douglas C. Curl
June 2002

Searching for KGS data

Finding information about the geology and mineral and water resources of Kentucky has never been easier! KGS is providing Web-based services that broaden the distribution of geologic information; a user-friendly interface gives the general public and geologic professionals up-to-date data, publications, and maps 24 hours a day, 7 days a week. With any Web browser, users can search for geologic data and publications; view descriptive information about requested data; and, in many cases, view and download data, publications and maps.

Information about KGS publications and maps, oil and gas well data, coal borehole data, coal production data, and water well data is currently available for online searching on the KGS Web site at www.uky.edu/kgs/pubs/lop.htm. The publications, maps, and data can also be accessed from the KGS home page at www.uky.edu/kgs/ by clicking the "Search Databases and Publications" icon. The intent is to provide a single portal for accessing all publications, maps, and data that KGS is making available online.

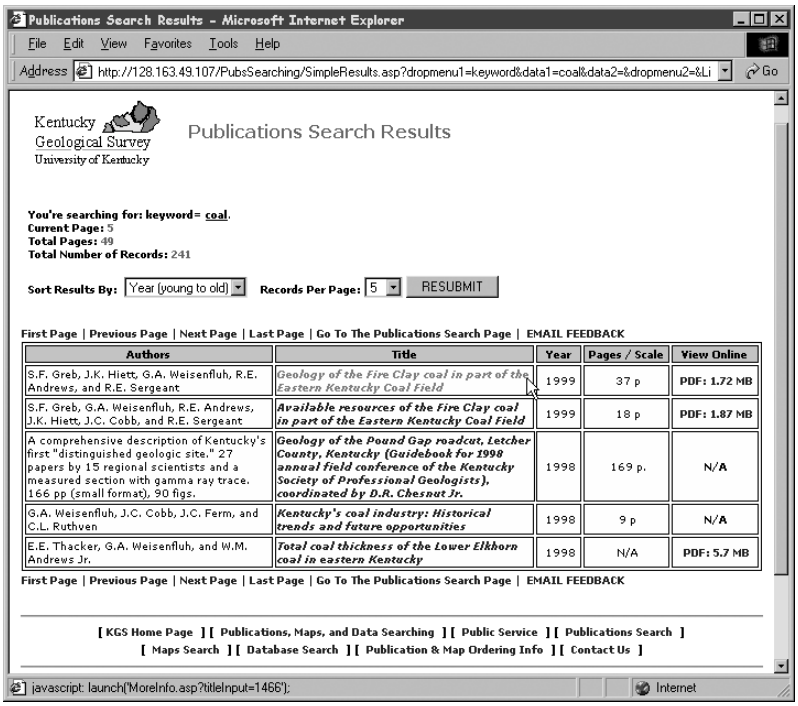
KGS publications and maps

The online search engine for publications and maps was developed to enhance the traditional "List of Publications" that KGS previously published in hard copy at regular intervals. The online search engine provides immediate access to the most up-to-date list of more than 4,000 KGS publications and maps in a user-friendly format that allows users to search by type of publication (for example, Information Circulars or Bulletins) or by keywords, titles, authors, or dates. Users can also search for out-of-print and nontraditional publications, as well as serial maps (for example, topographic maps).

Many KGS documents have been electronically scanned or prepared as Web pages. The search engine allows users to quickly access the requested documents, if they are available online. This convenience will enable users to save time and money by downloading the online publications and maps.

Data searching

KGS maintains numerous research databases of geologic information on the mineral and water resources of Kentucky. Traditionally, the public gained access to these data through direct contact with KGS personnel (telephone, fax, e-mail, or personal contact), which limited access to normal business hours. Four of the databases (oil and gas well records, coal borehole location data, coal production data, and water well records) are now available online in a searchable format. This online service provides access more efficiently, 24 hours a day, 7 days a week, from the convenience of the user's office, home, public library, school, or any place with Internet access. Many of the services performed by KGS staff (such as searching for water wells by entering a latitude and longitude point) can now be easily performed online by any interested persons. Some data searches help users narrow requests before they contact KGS for additional information. Many of the data can be obtained online without the user having to contact KGS directly, which is a service that KGS will expand in the future.



Results of a publications search.

Accessing oil and gas well data and scanned well logs

Users may search for descriptive and location information for more than 157,000 oil and gas wells in Kentucky, and download and view scanned oil and gas well logs, if they are available. In the past, persons interested in obtaining oil and gas well logs had to come to the KGS offices in Lexington or Henderson, and either study the logs or spend time and money making copies. Users across the state and outside Kentucky can now quickly search for and view the oil and gas well logs online, and print them for their own use! Searches can be performed by selecting a county or 7.5-minute quadrangle, or by entering the desired Carter coordinate location. A page displaying the results of the search has pertinent descriptive information for each well (such as farm and owner name, completion data, and penetrated formations), along with a link to the scanned well log, which can be viewed online by downloading a

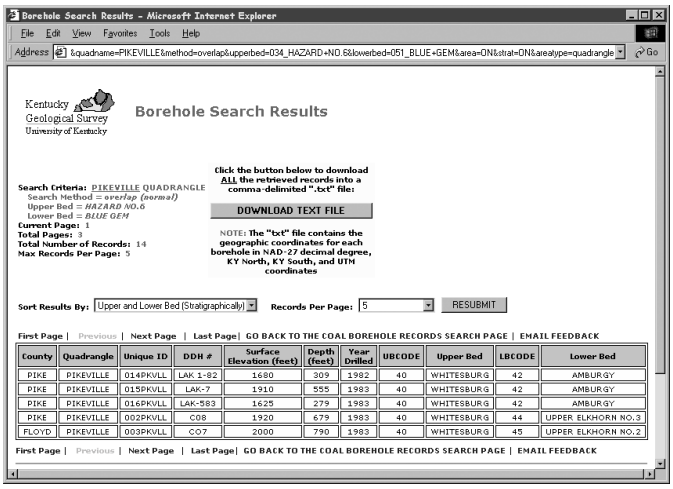
free browser plug-in. There is also a link to view each well location on an interactive topographic map. When the interactive map link is clicked, another browser window opens, and the selected well location can be viewed, together with the well locations in the surrounding area. Tools in the interactive maps allow a user to zoom in and out, and pan across the map to view all the oil and gas well locations in Kentucky.

Coal data

Coal boreholes are drilled to obtain subsurface information about areas where coal is located. Persons interested in obtaining detailed stratigraphic information for specific boreholes can narrow their searches from the more than 6,000 records archived at KGS by conducting an online search. Although the detailed borehole data (stratigraphic and lithologic information) can be purchased only by contacting KGS directly, descriptive information about borehole data is available online to allow users to review location, elevation, and other pertinent characteristics of the boreholes prior to ordering. Coal production data from 1790 through 2000 are available online, and a service to allow users to search and retrieve information from more than 33,000 coal thickness measurements will be available soon.

Water data

The Kentucky Groundwater Data Repository maintained by KGS has data for more than 56,000 water wells in Kentucky. KGS staff respond to about 100 requests for groundwater data per month and provide location information for requested wells. This popular service is now available online, and users can search through records and obtain descriptive and location data for specified wells. Users have the option of searching for data based on county, quadrangle, and a specified radius around a given latitude/longitude point. The online search yields descriptive information about a well (AKGWA number, total depth, depth to bedrock, static water level, primary use, etc.) and location information, and users have the option of viewing an individual well location or a selected group of well locations on an interactive map. The requested water well records can be downloaded along with location information for plotting on a map, either manually or using GIS software.

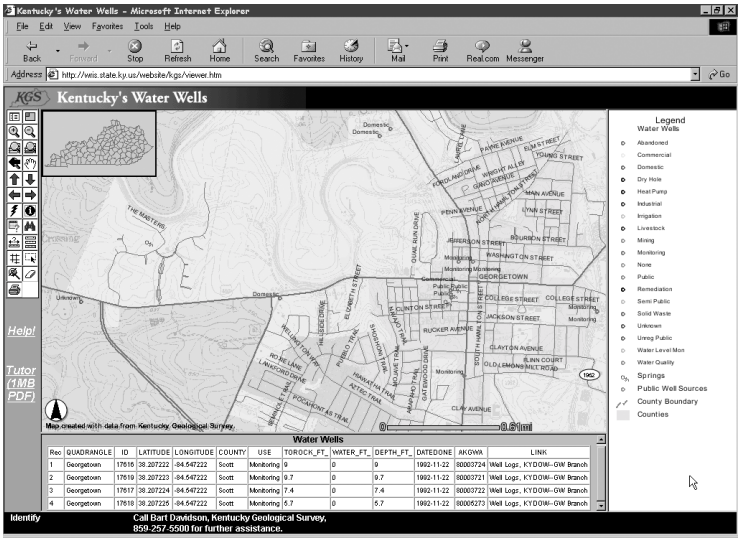


Results of a coal borehole search.

GIS for everyman: Internet map serving

Using ArcIMS software by ESRI, Inc., KGS has implemented Internet map services for water, oil and gas, coal, and land-use planning. Users can locate data from KGS data repositories by query or map searches, perform spatial analysis, print maps, download data, and link to related data sources. Developed in cooperation with the Water Resources Information System maintained by the Kentucky Infrastructure Authority, these Internet map servers at kygeonet.state.ky.us/ims.htm provide ready access to information necessary for development planning by the private sector; local, regional, State, and Federal agencies; and citizens.

For more information about the Internet map serving, contact Dan Carey at 859.257.5500 ext. 157 or by e-mail at carey@kgs.mm.uky.edu. ❖



An ArcIMS project showing water well information.

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Visit the KGS online catalog of publications at www.uky.edu/kgs/pubs/lop.htm
Publication Sales Office: 859.257.3896 or 1.877.778.7827

For more information about the online publications and data at KGS, contact Doug Curl at 859.257.5500 ext. 140 or by e-mail at dcurl@kgs.mm.uky.edu.

Spotlight on new publications

"Roadside Geology Along the Alexandria to Ashland Highway—Kentucky 9, Kentucky 10, and U.S. 23 Between Greenup Locks and Dam and Interstate 64," by Gregory A. Schumacher, Paul Edwin Potter, Martin C. Noger, Garland R. Dever Jr., and John Klee

These new roadlogs published on CD-ROM will help geologists, teachers, students, and interested travellers recognize, appreciate, and better understand some of the world's classic geology that is revealed in rock units and geologic features (such as faults, fossil localities, stratigraphic boundaries, and ancient river valleys) exposed along or adjacent to the beautiful Alexandria–Ashland Highway in northern Kentucky. No formal training in geology is required to understand these roadlogs. A glossary of geologic terms, illustrations, and photographs are included to guide the user. For more information, contact Gregory Schumacher at 614.265.6597 or by e-mail at greg.schumacher@dnr.state.oh.us. ❖

Are you interested in geographic names on government maps?

The Kentucky Geographic Names Committee (KGNC) was organized in 1985 as the State's liaison with the U.S. Board on Geographic Names, the Federal agency that considers proposals from persons and groups throughout the United States. Kentuckians who would like to give names to unnamed places or geographic features, change names that appear on government maps, or correct errors of spelling or location on Kentucky maps may bring their requests to the attention of the KGNC. Contact the committee by writing to the committee chair, Robert M. Rennick, 586 Riverside Dr., Prestonsburg, KY 41653-7744, or by sending an e-mail message to Scott Hankla at hshankla@yahoo.com. Visit the KGNC Web site at www.uky.edu/kgs/gis/intro.html. ❖

KGS geologist named "Geologist of the Year" by Kentucky Section of AIPG

David Williams, manager of the KGS field office in Henderson, received the American Institute of Professional Geologists–Kentucky Section's "Geologist of the Year" award at the institute's spring banquet, May 11. ❖

Field notes from across Kentucky

John Kiefer, Assistant State Geologist, has been named chairman-elect of the Southeastern Section of the Geological Society of America (GSA) by the Southeastern Section Management Board. His term as chairman will be for the 2003–04 fiscal year. Kiefer will also continue to serve as chairman of the Southeastern Section GSA's Committee on Geology and Public Policy.

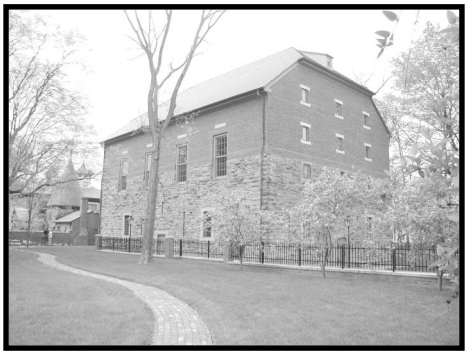
On March 20–21, in Little Rock, Ark., **John Kiefer** and **Zhenming Wang** participated in a special session of the U.S. Geological Survey's 5-year program planning for seismological research. Kiefer and Wang explained how seismic research at the University of Kentucky will contribute to the USGS's 5-year research plan. ❖

The First State Geologist of Kentucky

Honoring David Dale Owen

On April 19, David Jackson, president of the Kentucky Society of Professional Geologists, presented a $2,000 donation to the Rapp Granary in New Harmony, Ind., for the dedication of a window in the restored historic building. The donation is in honor of Kentucky's first state geologist, David Dale Owen. The recently restored granary was the site of Owen's laboratory from 1843 to 1859. Owen, the first state geologist appointed in the United States in 1837, was the renowned "pioneer geologist of the Middle West." He served as Kentucky's state geologist from 1854 to 1857. Owen's work in Kentucky resulted in four published volumes containing regional observations of stratigraphy, structure, and areal geology; detailed measured stratigraphic sections; chemical analyses of rocks, minerals, and soils; the first topographic maps depicting parts of Kentucky; and soil descriptions. His work provided the foundation for detailed economic and scientific research.

Presentation of the check by KSPG for the Rapp Granary Fund, April 19. Left to right: Eric Owen Arneburg (Mrs. Owen's grandson), Jane Blaffer Owen (wife of Kenneth Dale Owen, a descendant of Richard Owen, brother of David Dale Owen), David Jackson (president of KSPG).



The Rapp Granary.

State Geologist Jim Cobb and chair of the KGS Advisory Board, Henry Morgan, were also among those present at the dedication ceremony.

The Rapp Granary now serves as a conference center and geologic museum, and is open to the public for tours and special events. More information is available at www-lib.iupui.edu/kade/newharmony/granary.html. ❖

KGS mailing list

Would you like to receive the KGS newsletter and announcements of meetings and new publications? If so, we would like to add your name to our electronic mailing list. Please call us at 859.257.5500 or send an e-mail message to **Carol Ruthven** at cruthven@kgs.mm.uky.edu—simply type "Electronic-Mailing List Addition" in the subject line of your message, type your mailing address and phone and fax number in the message—and we will include your name and address in our mailing list. ❖

Calendar of events

- **September 19–21, 2002:** Kentucky Society of Professional Geologists fall field trip; contact Drew Andrews at 859.257.5500 or by e-mail at wandrews@kgs.mm.uky.edu
- **October 2–4, 2002:** Eastern Section–American Association of Petroleum Geologists meeting, Champaign, Ill., www.isgs.uiuc.edu/oilgas/eastaapg2002/
- **October 13–19, 2002:** Earth Science Week, www.earthscienceworld.org/week/
- **October 27–30, 2002:** Geological Society of America annual meeting, Denver, Colo., www.geosociety.org/meetings/2002/ ❖

Education outreach

- On February 23, **Tammi Johnson** spoke at the 2002 4-H Leadership Forum in Lexington to discuss the importance of geology in everyday life, and ways 4-H leaders can incorporate geology education into their curriculum. Information packets and maps were provided to the 25 participants.
- The KSPG fall field trip on Friday, September 20, will be spent examining the stratigraphy and structural geology of Camp Nelson, as well as the geomorphology, karst hydrology, landscape evolution, and human history of the site. September 21 will include a trip to the nearby Perryville battlefield to discuss the role of geology in the largest Civil War battle in Kentucky. For more information, contact **Drew Andrews** at 859.257.5500 ext. 138 (e-mail: wandrews@kgs.mm.uky.edu) or **Patrick Gooding** at 859.389.8810 (e-mail: gooding@kgs.mm.uky.edu).
- Mark your calendar for Earth Science Week, to be celebrated October 13–19. KGS will be hosting an open house on Wednesday, October 16, and conducting educational tours of McConnell Springs Park in Lexington for schoolchildren on October 17 and 18. For more information, visit the Web site at www.earthscienceworld.org/week/ or call **Carol Ruthven** at 859.257.5500 ext. 128 (e-mail: cruthven@kgs.mm.uky.edu). ❖

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